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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/530,047	04/01/2005	Akira Yabe	040894-7212	5518

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EXAMINER	
KO, STEPHEN K	

ART UNIT	PAPER NUMBER
1792	

MAIL DATE	DELIVERY MODE
04/01/2009	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/530,047	YABE ET AL.	
	Examiner	Art Unit	
	STEPHEN KO	1792	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *19 December 2008*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-38* is/are pending in the application.

4a) Of the above claim(s) *7-32 and 34-38* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-6 and 33* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *12/19/2008*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Specification

1. Objection to the specification is withdrawn in view of applicant(s) amendment.

2. Objection to the abstract is withdrawn in view of applicant(s) amendment.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

5. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to

consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

6. Claims 1-3, 5 and 33 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kashkoush et al (US 2002/0144709) in view of either applicant(s) admitted prior art or JP 55-180425 in further view of Azar (2004/0231697).

Kashkoush et al teach a cleaning method comprising the step of cleaning an object with water comprising the step of forming bubbles by megasonic energy [0006]).

Kashkoush et al remain silent about the size of the cleaning bubble.

However, applicant admitted that in order to enhance the functions of the bubbles, it is naturally considered to make the sizes of the bubbles smaller (paragraph 3 of the specification); or JP 55-180425 teaches that the cleaning effectiveness increases as the size of the cleaning bubble decrease (JP 55-180425, P.1, L.18 and P.2, L.1). Furthermore, the term nanobubble and the range of sizes for nanobubble are not defined by Applicants.

Since it is known in the art that the size of the bubble is depended on the frequency of the ultrasonic/megasonic wave (e.g. disclosed in Azar paragraph [0006]), it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the frequency of the megasonic wave in the method of Kashkoush et al by providing bubbles having a diameter in nanometer as inspired by applicant(s) admitted prior art or JP 55-180425 to increase cleaning effectiveness (JP 55-180425, P.1, L.18 and P.2, L.1).

For claim 5, note that Kashkoush et al teaches the water can contain HCL or NH4OH (Kashkoush et al, paragraph [0006])

7. Claims 1, 4 and 6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Gatto (US 2003/0187324) in view of either applicant(s) admitted prior art or JP 55-180425 in further view of Azar (2004/0231697).

Gatto teaches a method for ablating abnormal tissue (read as cleaning an organism, abstract) utilizing **microbubbles** (paragraph [0066]) with water (paragraph [0066]).

Gatto remains silent about the cleaning bubbles further comprising nanobubbles.

However, applicant admitted in order to enhance the functions of the bubbles, it is naturally considered to make the sizes of the bubbles smaller (paragraph 3 of the specification); JP 55-180425 teaches the cleaning effectiveness increase as the size of the cleaning bubble decrease (JP 55-180425, P.1, L.18 and P.2, l.1). Furthermore, the term nanobubble and the range of sizes for nanobubble are not defined by Applicants.

Since it is known in the art that the size of the bubble is depended on the frequency of the ultrasonic/megasonic wave (e.g. disclosed in Azar paragraph [0006]), it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the frequency of the megasonic wave in the method of Gatto by also providing bubbles comprising a diameter in nanometer as inspired by applicant(s) admitted prior art or JP 55-180425 to increase cleaning effectiveness.

Response to Arguments

8. Applicant's arguments with respect to claims 1-6 and 33 have been considered but are moot in view of the new ground(s) of rejection.

9. Regarding to applicant(s) argument that JP'425 it is improper to use a reference from 1979 to teach or suggest nanobubbles. Examiner position is that since JP 425 teaches cleaning effectiveness increase as the size of the cleaning bubble decrease and applicant(s) admitted that it is naturally to consider to make the sizes of the bubble smaller to enhance function of the bubble, it would have been obvious to one of ordinary skill in the art at the time the invention was made to make the nanobubbles for cleaning.

Conclusion

10. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to STEPHEN KO whose telephone number is (571)270-3726. The examiner can normally be reached on Monday to Thursday, 7:30am to 5:30pm EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael Kornakov can be reached on 571-272-1303. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Michael Barr/
Supervisory Patent Examiner, Art Unit 1792

SK